## AMENDMENT(S) TO THE CLAIMS:

The following listing of claims will replace all prior versions, and listings, of claims on the application. All claims are set forth below with one of the following annotations.

- (Original): Claim filed with the application.
- (Currently amended): Claim being amended in the current amendment paper.
- (Canceled): Claim cancelled or deleted from the application. No claim text is shown.
- (Withdrawn): Claim still in the application, but in a non-elected status.
- (New): Claim being added in the current amendment paper.
- (Previously presented): Claim added or amended in an earlier amendment paper.
- (Not entered): Claim presented in a previous amendment, but not entered or whose entry status unknown. No claim text is shown.

**1–8. (Cancelled).**

9. (Currently amended) A radio receiver ~~as recited in claim 6,~~ comprising:

___~~wherein the~~ a receive signal path ~~further comprises~~ including:

___a filter;

___a pre-filter section prior to the filter, the pre-filter section including at least one adjustable gain element to provide an adjustable gain to the pre-filter section; and

___at least one post-filter section after the filter, including a first post filter section immediately after the filter, the post-filter sections each including at least one adjustable gain element to provide an adjustable gain to the post-filter section;

___a pre-filter signal strength detector coupled to the pre-filter section to measure the relative strength of the signal at a point in the receive signal

path prior to filtering by the filter, the pre-filter signal strength detector having an output coupled to a first analog-to-digital converter and a first calibrator to provide a first multi-bit calibrated measure of the relative strength of the signal at the prior-to-filtering point;

a first post-filter signal strength detector coupled to the first pre-filter section to provide a measure of the relative strength of the signal at a first post-filtering point in the receive signal path after filtering by the filter, the first post-filter signal strength detector having an output coupled to a second analog-to-digital converter and a second calibrator to provide a second multi-bit calibrated measure of the relative strength of the signal at the first post-filtering point;

an automatic gain controller (AGC controller) coupled to the outputs of first and second calibrators of the pre-filter and first post-filter signal strength detectors and further coupled to the variable gain elements to set the gains of the respective sections according to the pre-filter and first post-filter multi-bit calibrated signal strength measures, the setting being to respectively set the pre-filter signal strength and the first post-filter signal strength to a desired pre-filter signal power and a desired first post-filter signal power, respectively, the gains setting providing an overall gain setting for the receive path; and

~~an analog~~ a main analog to digital converter (ADC) configured to convert the output of the last analog section in the receiver signal path to a digital output signal,

such that the gain settings of the pre-filter and first post filter variable gain elements adapt to achieve the desired pre-filter and post-filter signal powers according to the signal characteristics, and take into account the amount of filtering provided by the filter,

wherein the ACG controller corrects and averages each of the pre-filter and first post-filter signal strength indications, compares the pre-filter and first post-filter corrected averaged signal strength indications to respective pre-filter and first post-filter desired signal powers, and adjusts the gains of the respective sections to reduce the differences between the corrected averaged indications and desired signal powers,

wherein the ACG controller operates in sequential stages, each stage setting the gains of one or more sections to achieve desired signal strength levels including the desired pre-filter signal strength level and a desired post-filter signal strength levels, the adjustment of each section being by a variable amount that depends on the calibrated measures of the relative strength,

wherein a first stage sets the gain of the pre-filter section according to the pre-filter signal strength indication and sets the gain of the first post filter section according to both the pre-filter signal strength indication and the first post-filter signal strength indication without requiring use of the digital output signal of the ADC, and other stages finalize the gain setting of any other post-filter sections, according to additional signal strength indications from the relevant sections,

wherein the first post-filter signal strength detector is coupled to the first pre-filter section,

wherein at least the first stage sets the gain of the pre-filter section and first post filter section to bring the input of the ADC to within the range of the ADC,

wherein there are two or more post filter sections including a first post filter section and a second post filter section, the second post signal section including the analog to digital converter,

wherein the post-filter signal strength detector is coupled to the first pre-filter section,

wherein the digital signals from the ADC provide a measure of the signal strength post-digitization digitization to the AGC controller, and

wherein the AGC controller is to set the gains of the pre-filter section, the first post-filter section, and the second post filter section according to the pre-filter and post-filter signal strength measures and the post-digitization signal strength measure.

## 10.–12. (Cancelled).

13. (Currently amended) A method ~~as recited in claim 11,~~ for controlling the gain of a radio receiver, the receiver having a receive signal path including

a filter;

a pre-filter section prior to the filter, the pre-filter section including at least one adjustable gain element to provide an adjustable gain to the pre-filter section; and

at least one post-filter section after the filter, including a first post filter section immediately after the filter, the post-filter sections each including at least one adjustable gain element to provide an adjustable gain to the post-filter section;

the method comprising:

accepting a first multi-bit calibrated measure of the pre-filter relative signal strength at a point in the receive signal path prior to filtering by the filter;

accepting a second multi-bit calibrated measure of the post-filter relative signal strength at a first post-filtering point in the receive signal path after the filtering by the filter;

setting the gains of the respective sections according to the first pre-filter and second post-filter signal strength multi-bit calibrated measures, the setting being to respectively set the pre-filter signal strength and the first post-filter signal strength to a desired pre-filter signal power and a desired

first post-filter signal power, respectively, the gain setting providing an overall gain setting for the receive signal path;

analog to digital converting the output of the last analog section in the receiver signal path to a digital output signal,

such that the gain settings of the pre-filter and post filter variable gain elements adapt to achieve the desired pre-filter and post-filter signal powers according to the signal characteristics, and take into account for the amount of filtering provided by the filter, and

such that the gain setting of the pre-filter and first post filter variable gain elements does not require use of the digital output signal from the converting,

wherein the accepting of the measures includes:

calibrating the pre and first post-filter signal strength measures so that they may be compared, and ~~wherein the accepting of the measures includes~~

averaging each of the pre-filter and first post-filter signal strength measures, and

wherein the setting of the gains includes comparing the pre-filter and first post-filter corrected averaged signal strength measures to respective pre-filter and first post-filter desired signal powers, and adjusting the gains of the respective sections to reduce the differences between the corrected averaged measures and the respective desired signal powers.

14. (Previously presented) A method as recited in claim 13, wherein the setting of the gains of at least one of the sections depends on both the pre-filter and first post-filter corrected averaged signal strength measures to account for the amount of filtering provided by the filter.

**15.–17. (Cancelled).**

18. (Currently amended) A method ~~as recited in claim 15,~~ for controlling the gain of a radio receiver for receiving packets of information, the receiver connected to an antenna subsystem, the receiver including a receive signal path including a plurality of sections including a first section coupled to the antenna subsystem, a next section, and an analog-to-digital converter (ADC) coupled to the output of the last analog section in the receiver signal path to output a digital output signal, each section having an adjustable gain, each section able to provide a multi-bit calibrated measure of the signal strength at its output; the method comprising:

waiting for a start of packet indication;

providing multi-bit calibrated measures of the signal strengths at the outputs of the first and the next sections; and

adjusting the gains of the first and the next sections using the provided measures of signal strength, the adjusting being to respectively set the signal strength at respective outputs of the sections to respective desired levels, in order to set the overall gain of the receive signal path,

such that the gain adjusting of at least the first section does not require use of the digital output signal from the ADC,

wherein gain adjusting of the sections is carried out sequentially in respective sequential AGC stages, each sequential stage adjusting the gain of one or more corresponding sections, each stage including:

providing a measure of the signal strengths at the ends of the corresponding sections;

comparing the provided calibrated measures of signal strengths at the ends of the corresponding sections to a desired signal strength level for each corresponding section; and

adjusting the gain of the corresponding sections by a variable amount that depends on the respective differences between the desired levels and the provided calibrated measures of signal strength for the respective corresponding sections.

19. (Original) A method as recited in claim 18, wherein the providing the measures of the signal strengths at the ends of the sections includes calibrating so that the measures may be compared.

20. (Original) A method as recited in claim 19,

wherein the receiver includes a filter in the receive signal path, the providing a measure of the signal strength at the output of the first section being at a point before the filter, and the providing a measure of the signal strength at the output of the next section being at a point after the filtering, and

wherein the desired level of at least one of the sections depends on both the provided measure of signal strength at the output of the first section and at the output of the next section such that the gain adjusting accounts for the amount of filtering by the filter.

21. (Previously presented) A method as recited in claim 18, wherein each gain adjusting stage finalizes the gain of one corresponding section, such that the providing the signal strength measure and the adjusting of the first section's gain is carried out during a first AGC stage, the finalizing of the adjusting of the second section's gain is carried out during a second AGC stage, respectively, and wherein the method comprises for each stage and corresponding section:

providing a measure of the signal strengths at the end of the sections;

comparing the provided measure of signal strength at the end of the corresponding section to a desired signal strength level for the corresponding section; and

adjusting the gain of the corresponding section by a variable amount that depends on the difference between the desired level and the provided measure of signal strength for the corresponding section.

22. (Original) A method as recited in claim 18, wherein the radio is for operation in a wireless network conforming to the IEEE 802.11 standard.

23. (Original) A method as recited in claim 18, wherein the ACG controller takes approximately 1 to 2 μs for each AGC stage.

24. (Previously presented) A method as recited in claim 18,

wherein the receiver is a superheterodyne receiver that includes in its receive signal path a first downconverter to convert a received signal at RF to an IF signal, a second downconverter to convert the IF signal to baseband, and a filter at IF between the first and second downconverters, the receive signal part further including a filter in the IF part,

wherein the receive signal path is including a pre-filter section before the filter, a post filter section after the filter, and a third section after the post-filter section,

wherein the plurality of AGC stages includes three stages, the first stage including setting the gain of at least the pre-filter section, the second stage including setting the gain of the post-filter section, and the third stage including setting the gain of the third section.

25. (Previously presented) A method as recited in claim 24,

wherein the providing of the measure of signal strength for the pre-filter and post-filter stages includes for each stage providing a measure of the respective signal

strength in a logarithmic scale, converting the respective measured signal strength to digital signal strength samples, correcting and averaging a respective set of the digital signal strength samples to produce pre-filter and post-filter signal strength measurements, respectively, to compare to the desired values in the respective comparing steps, and

wherein the providing the measure of signal strength for the third stage includes providing a baseband output of the third section, using the ADC to convert the baseband output of the third section to digital samples of the digital output signal, converting the digital samples to digital signal strength samples in a logarithmic scale, correcting and averaging a set of the logarithmic-scale digital signal strength samples to produce a third signal strength measurement to compare to the desired value in the comparing step of the third stage.

26. (Original) A method as recited in claim 18, wherein the receiver is coupled to a two antennas via a diversity switch; the method further comprising in one of the AGC stages selecting the antenna to use according to at least one of the provided measurements of signal strength.

27. (Original) A method as recited in claim 26, wherein the determining of which antenna to use is carried out only for weak signals and replaces the first AGC stage.

28. (Original) A method as recited in claim 18,

wherein at each stage,

the comparison for each section determines a respective setpoint error, and

the adjusting of each section includes determining a requested gain as the existing gain, produced by the current gain setting, minus the setpoint error from the respective comparison step, the adjusting including mapping the existing gain minus the setpoint error to a respective gain setting.

29. (Previously presented) A method as recited in claim 28,

wherein the result of providing a measure of signal strength for at least one of the sections is used to update the gain settings for multiple selected sections of the receive path.

## 30.–31. (Cancelled).

32. (Currently amended) An AGC controller ~~as recited in claim 30,~~ to control the gain of a radio receiver for receiving packets of information, the receiver including:

a receive signal path including a plurality of sections, each section having an adjustable gain, the plurality of sections including a first section coupled to an antenna subsystem and a next section;

an analog-to-digital converter (ADC) coupled to the output of the last analog section in the receiver signal path to output a digital output signal; and

a signal strength measurer coupled to each section to provide a multi-bit measure of the signal strength at the section's output,

the AGC controller being configured to:

wait for a start of packet indication;

accept multi-bit measures of the signal strengths from the signal strength measurers at the outputs of the first and next sections; and

adjust the gains of the first and the next sections using the accepted measures of signal strengths, the adjusting being to respectively set the signal strength at respective outputs of the sections to respective desired levels, in order to set the overall gain of the receive signal path,

such that the gain adjusting of at least the first section does not require using the digital output signal from the ADC,

wherein the gain adjusting of the sections is carried out sequentially in respective sequential AGC stages, each sequential stage corresponding to and adjusting the gains of one or more corresponding sections, such that the ACG controller is configured to, after the start of packet indication, carry out a plurality of sequential AGC stages, each stage having one or more corresponding sections, carrying out a stage including for each stage and corresponding sections:

accepting a measure of the signal strength at the end of the corresponding sections;

comparing the measured signal strength at the end of the corresponding sections corresponding to respective desired levels for the respective corresponding sections; and

adjusting the gains of the corresponding sections by a variable amount that depends on the respective differences between the respective desired level and the respective measured signal strengths for the respective corresponding sections.

33. (Previously presented) An AGC controller as recited in claim 32,

wherein the receiver is a superheterodyne receiver that includes in its receive signal path a first downconverter to convert a received signal at RF to an IF signal, a second downconverter to convert the IF signal to baseband, and a filter at IF between the first and second downconverters, the receive signal part further including a filter in the IF part,

wherein the receive signal path is including a pre-filter section before the filter, a post filter section after the filter, and a third section after the post-filter section,

wherein the plurality of AGC stages includes three stages, the first stage including setting the gain of at least the pre-filter section, the second stage including setting the gain of the post-filter section, and the third stage including setting the gain of the third section.

34. (Original) An AGC controller as recited in claim 32,

wherein for each stage:

the comparisons of each of the corresponding sections determine respective setpoint errors for each of the corresponding sections, and

the adjusting of each respective corresponding section determines a requested gain as the existing gain, produced by the current gain setting, minus the setpoint error from the respective comparison step, the adjusting including mapping the existing gain minus the setpoint error to a respective gain setting.

35. (Original) An AGC controller as recited in claim 34,

wherein the result of each section's measuring is used to update the gain settings for multiple selected sections of the receive path.

36. (Original) An AGC controller as recited in claim 34, comprising a finite stage machine configured to carry out the waiting and AGC stages.

37. (Original) An AGC controller as recited in claim 34, comprising a processing system programmed to carry out the waiting and AGC stages.

38. (Previously presented) An apparatus for controlling the gain of a radio receiver for receiving packets of information, the receiver including:

a receive signal path including a plurality of sections, each section including means to control the section's gain;

means for analog-to-digital converting coupled to the output of the last analog section in the receiver signal path to output a digital output signal; and

means for measuring a multi-bit measure of the signal strength at the section's output;

the apparatus comprising:

means for waiting for a start of packet indication; and

means for carrying out a plurality of sequential AGC stages, each stage corresponding to adjusting the gain of one or more sections, the means for carrying out a sequential AGC stage including for each stage and corresponding sections:

means for receiving multi-bit measures of the signal strengths at the end of the corresponding sections;

means for comparing the measured signal strengths at the ends of the corresponding sections to respective desired signal strength levels for the respective corresponding sections; and

means for adjusting the gains of the corresponding sections by a variable amount that depends on the differences between the respective desired levels and the respective measured signal strengths for the corresponding sections,

such that the means for adjusting the gains adjusts the gains of at least the first section without requiring use of the digital output signal.

39. (Original) An apparatus as recited in claim 38, wherein the receiver includes a filter in the receive signal path, the means for measuring at the end of the first section being

at a point before the filter, and the means for measuring at the end of the second section being at a point after the filtering.

**40.–41. (Cancelled).**

42. (Currently amended) A radio receiver ~~as recited in claim 8,~~ comprising:

a receive signal path including:

a filter;

a pre-filter section prior to the filter, the pre-filter section including at least one adjustable gain element to provide an adjustable gain to the pre-filter section; and

at least one post-filter section after the filter, including a first post filter section immediately after the filter, the post-filter sections each including at least one adjustable gain element to provide an adjustable gain to the post-filter section;

a pre-filter signal strength detector coupled to the pre-filter section to measure the relative strength of the signal at a point in the receive signal path prior to filtering by the filter, the pre-filter signal strength detector having an output coupled to a first analog-to-digital converter and a first calibrator to provide a first multi-bit calibrated measure of the relative strength of the signal at the prior-to-filtering point;

a first post-filter signal strength detector coupled to the first pre-filter section to provide a measure of the relative strength of the signal at a first post-filtering point in the receive signal path after filtering by the filter, the first post-filter signal strength detector having an output coupled to a second analog-to-digital converter and a second calibrator to provide a second

multi-bit calibrated measure of the relative strength of the signal at the first post-filtering point;

an automatic gain controller (AGC controller) coupled to the outputs of first and second calibrators of the pre-filter and first post-filter signal strength detectors and further coupled to the variable gain elements to set the gains of the respective sections according to the pre-filter and first post-filter multi-bit calibrated signal strength measures, the setting being to respectively set the pre-filter signal strength and the first post-filter signal strength to a desired pre-filter signal power and a desired first post-filter signal power, respectively, the gains setting providing an overall gain setting for the receive path; and

a main analog to digital converter (ADC) configured to convert the output of the last analog section in the receiver signal path to a digital output signal,

such that the gain settings of the pre-filter and first post filter variable gain elements adapt to achieve the desired pre-filter and post-filter signal powers according to the signal characteristics, and take into account the amount of filtering provided by the filter,

wherein the ACG controller corrects and averages each of the pre-filter and first post-filter signal strength indications, compares the pre-filter and first post-filter corrected averaged signal strength indications to respective pre-filter and first post-filter desired signal powers, and adjusts the gains of the respective sections to reduce the differences between the corrected averaged indications and desired signal power,

wherein the ACG controller operates in sequential stages, each stage setting the gains of one or more sections to achieve desired signal strength levels including the desired pre-filter signal strength level and a desired post-filter signal strength levels, the

adjustment of each section being by a variable amount that depends on the calibrated measures of the relative strength,

wherein a first stage sets the gain of the pre-filter section according to the pre-filter signal strength indication and sets the gain of the first post filter section according to both the pre-filter signal strength indication and the first post-filter signal strength indication, and other stages finalize the gain setting of any other post-filter sections, according to additional signal strength indications from the relevant sections, such that the gain settings of the pre-filter and first post filter variable gain elements in the first stage does not require use of the digital output signal of the ADC,

wherein the first post-filter signal strength detector is coupled to the first pre-filter section,

wherein at least the first stage sets the gain of the pre-filter section and first post filter section to bring the input of the ADC to within the range of the ADC,

wherein there are two or more post filter sections including the first post filter section and a second post filter section, the second post signal section including the analog to digital converter, and

wherein the digital signals from the ADC provide a measure of the signal strength post-digitization to the AGC controller,

such that, after the first stage, the AGC controller can set the gain of the second post filter section according to at least the post-digitization signal strength measure.

## 43. (Cancelled).

44. (Previously presented) A method as recited in claim 18, wherein at least the first stage sets the gains of at least the first section in order to bring the input of the ADC to within the range of the ADC.